

What is claimed is:

1. A lift producing apparatus comprising:

- (a) a pair of side by side, hollow, cylindrical impellers, each said impeller having a drive shaft, a center line, a diameter and a plurality of impeller blades, said impeller blades having outer edges, longitudinal axes that are substantially parallel to said impeller center line and having transversal axes substantially perpendicular to and thus substantially radial to said impeller center line,
- said plurality of impeller blades are symmetrically and evenly distributed and attached by fixed means to said drive shaft at a predetermined distance from said center line,
- said pair of impellers having a left impeller and a right impeller,
- said center lines of impellers defining a plane of center lines,
- a volume of space between said left impeller center line and said right impeller center line,
- a bilateral plane of symmetry bisecting said space between impeller center lines,
- (b) a pair of side by side, circular, coplanar, planar, front vortex seals, each of said front vortex seals having a lower edge an inner surface, an outer surface, an inner surface, a center line, and a diameter that is slightly larger than said diameters of impellers,
- said pair of vortex seals having a left front vortex seal and a right front vortex

seal,

said left front vortex seal is perpendicularly attached at the intersection of said inner surface and said center line of left front vortex seal to left impeller by rotatable means,

said right front vortex seal is perpendicularly attached at the intersection of said inner surface and said center line of right front vortex seal to right impeller by rotatable means,

- (c) a pair of side by side, hollow semicylindrical lifting surfaces each having a substantially semicircular cross section, a center line, a roughened upper surface facing substantially upward, toward said plane of center lines, a lower surface facing substantially downward, away from said plane of center lines, a proximal edge facing toward said bilateral plane of symmetry and a distal edge facing away from said bilateral plane of symmetry,
- said pair of lifting surfaces having a left lifting surface and a right lifting surface,
- said center line of left lifting surface aligned colinearly with said center line of left impeller,
- said center line of right lifting surface aligned colinearly with said center line of right impeller,
- said proximal edge and distal edge of said left lifting surface defining a left dihedral plane,
- said left dihedral plane subtending an acute counter clockwise angle with said plane of center lines,

09024749-021798
862720-642060

said acute angle defined as left dihedral angle,

said proximal edge and distal edge of said right lifting surface defining a right dihedral plane,

said right dihedral plane subtending an acute clockwise angle with said plane of center lines,

said acute angle defined as right dihedral angle,

said left dihedral angle and said right dihedral angle having substantially equal magnitudes and opposite angular directions,

said left lifting surface attached by fixed airtight means to said lower edge of left front vortex seal,

said right lifting surface attached by fixed airtight means to said lower edge of right front vortex seal,

(d) a pair of air guides that are planar and elongated having an upper edge and a lower edge,

said pair of air guides having a left air guide and a right air guide,

said upper edge of left air guide is attached by fixed means to said distal edges of left lifting surface,

said lower edge of left air guide is aligned in a direction from said upper edge of left air guide that is simultaneously parallel to said bilateral plane of

symmetry and opposed to and perpendicular to said plane of center lines,

said lower edge of right air guide is aligned in a direction from said upper edge of right air guide that is simultaneously parallel to said bilateral plane of symmetry and opposed to and perpendicular to said plane of center lines,

(e) a pair of air knives formed by the junction of said air guides to said lifting surfaces,

said pair of air knives having a left air knife and having a right air knife,

(f) a pair of side by side, coplanar, circular, planar, rear vortex seals each having an outer edge, an inner surface and outer surface, a center line, a lower edge relative to said reference plane, a circular hole concentric to said outer edge of rear vortex seal,

said pair of rear vortex seals having a left rear vortex seal and a right rear vortex seal,

said left rear vortex seal oriented perpendicularly relative to said impeller center line and attached by fixed air tight means to said left lifting surface with said inner surface of left lifting surface facing toward said inner surface of left front vortex seal and said left impeller drive shaft extending along its center line through said circular hole past said outer surface of left rear vortex seal, said right vortex seal oriented perpendicularly relative to said impeller center line and attached by fixed air tight means to said right lifting surface with said inner surface of right rear vortex seal facing toward said inner surface of right front vortex seal and said right impeller drive shaft extending along its center line through said circular hole past said outer surface of right rear vortex seal,

(g) a pair of side by side air pumps each having an inlet with a center line, said pair of air evacuators having a left air evacuator and a right air evacuator,

said left air pump attached by fixed air tight means to the outer surface surrounding said circular hole in left rear vortex seal,
said right air pump attached by fixed air tight means to the outer surface regions surrounding said circular hole in right rear vortex seal,

- (h) a power plant attached by transmissive means to said left impeller and said right impeller, and attached by transmissive means to said left air evacuator and to said right air evacuator.

2. A method of generating a lifting force by way of the Bernoulli Effect comprising the steps of:

- (a) transmitting counter clockwise torque from said power plant to said left impeller causing said left impeller to rotate in a counter clockwise direction,
(b) transmitting clockwise torque from said power plant to said right impeller causing said right impeller to rotate in a clockwise direction,
(c) forcing the layer of air embedded between said left impeller blades to rotate with same angular velocity as said left impeller and dragging along the volume of air inside said hollow left impeller and causing said volume of air in said hollow impeller to also rotate with the same said angular velocity as said left impeller to create left forced vortex, said left forced vortex having a surface swept out said outer edges impeller blades during said rotation of said left impeller,
said left forced vortex having a lower surface, an upper surface, a front end, a rear end, an axis of rotation, a core, an upward driving surface and downward

driving surface, said surface of left forced vortex having a high predetermined tangential velocity,

- (d) forcing the layer of air embedded between said right impeller blades to rotate with same angular velocity as said right impeller and dragging along the volume of air inside said hollow right impeller and causing said volume of air in said hollow impeller to also rotate with the same said angular velocity as said right impeller to create right forced vortex, said right forced vortex having a surface swept out said outer edges impeller blades during said rotation of said right impeller,
- said right forced vortex having a lower surface, an upper surface, a front end, a rear end, an axis of rotation, a core, an upward driving surface and downward driving surface, said surface of left forced vortex having a high predetermined tangential velocity,
- (e) reducing the pressure of air in said left forced vortex and volumes of air surrounding said left forced vortex via said Bernoulli Effect, creating said Bernoulli Effect by rotating said left forced vortex surfaces past said volumes of air surrounding said forced vortex surfaces,
- (f) reducing the pressure of air in said right forced vortex and volumes of air surrounding said right forced vortex via said Bernoulli Effect, creating said Bernoulli Effect by rotating said right forced vortex surfaces past said volumes of air surrounding said forced vortex surfaces,
- (g) sealing ends of said left forced vortex by blocking an inflow high pressure low velocity into said core of said left forced vortex with said front and rear left

vortex seals,

- (h) sealing ends of said right forced vortex by blocking an inflow high pressure low velocity into said core of said right forced vortex with said front and rear right vortex seals,
- (i) canceling reactive torques generated by creation and maintenance of said left and right forced vortices at said power plant,
- (j) accelerating air that is in contact with said downward moving surface of left forced vortex in a downward direction,
- (k) accelerating air in contact with said downward moving surface of right forced vortex in a downward direction,
- (l) severing said accelerated air from the periphery of said left forced vortex with said left air knife,
- (k) severing said accelerated air from the periphery of said right forced vortex with said right air knife,
- (m) guiding previously said accelerated air downward and away from said lower side of said left lifting surface,
- (n) guiding previously said accelerated air downward and away from said lower side of said right lifting surface,
- (o) generating said lifting force on said left lifting surface by bringing said low pressure high velocity air surrounding said left forced vortex surface into contact with said upper surface of left lifting surface and exposing said lower side of lifting surface to lower velocity higher pressure air protected by said

left air guide,

- (p) generating said lifting force on said right lifting surface by bringing said low pressure high velocity air surrounding said right forced vortex surface into contact with said upper surface of right lifting surface and exposing said lower surface of lifting surface to lower velocity higher pressure air protected by said right air guide,
- (q) protecting said upward driving surfaces of left forced vortex to prevent substantial upward acceleration of said surrounding volumes of air around said left forced vortex,
- (r) protecting said upward driving surfaces of right forced vortex to prevent substantial upward acceleration of said surrounding volumes of air around said right forced vortex/.

3. A method as forth in claim 2 further including,

- (a) making turbulent said surface left of forced vortex and said surrounding volues of air by rotating said left forced vortex and said surrounding volumes of air past roughened surface of left lifting surface,
- (b) making turbulent said surface right of forced vortex and said surrounding volumes of air by rotating said right forced vortex and said surrounding volues of air past roughened surface of right lifting surface.

4. A method as set forth in claim 2 further including,

- (a) pumping air out of said core of left forced vortex with said left air evacuator,
- (b) pumping air out of said core of right forced vortex with said right air

evacuator,

- (c) replacing said chaotic surface air of said left vortex drawn inward by evacuation of air out of said core of left forced vortex with more laminar air outside of said left forced vortex surface,
- (d) replacing said chaotic surface air of said right vortex drawn inward by evacuation of air out of said core of right forced vortex with more laminar air outside of said right forced vortex surface.

09024749-021798
B67T20-64742060